

What is claimed:

1. A combination of a socket and an extension, the combination comprising:

a socket including a first end having a square hole and a second end adapted to engage with a fastener, the square hole being defined by a plurality of sidewalls, each said sidewall having a concave portion in an intermediate portion thereof; and

an extension comprising a main body having a first end adapted to be releasably engaged with a wrench and a second end spaced from the first end of the main body in an axial direction, a driving column being formed on the second end of the main body for releasable engagement with the square hole of the socket, the driving column including a recessed section defined in a periphery thereof adjacent to the second end of the main body, and a shoulder being defined between the recessed section and the second end of the main body, the shoulder having a cross sectional size perpendicular to the axial direction that is greater than a cross sectional size of the recessed section perpendicular to the axial direction and smaller than a cross sectional size of the main body perpendicular to the axial direction, the driving column including a receptacle, a ball and an elastic element being received in the receptacle, the ball being biased by the elastic element to partially protrude out of the receptacle;

the main body, the shoulder, and the driving column including the recessed section being integrally formed as a single component;

the driving column being engageable with the concave portions of the square hole of the first end of the socket spaced from the main body with a gap being defined between the recessed section of the driving column and the sidewalls defining the square hole of the socket and with the ball pressing against one of the concave portions of the square hole under action of the elastic element, the concave portions of the square hole of the socket allowing the driving column of the extension to move to a desired orientation relative to the socket, thereby allowing angular joint therebetween for operation in a difficult-to-operate condition; and

the shoulder of the driving column being engageable with the sidewalls defining the square hole of the socket in a position other than the concave portions to provide high torque transmission therebetween in which a longitudinal axis of the driving column coincides with that of the socket, wherein the ball is received in the receptacle of the driving column and

presses against one of the sidewalls defining the square hole of the socket in a position other than the concave portions under action of the elastic element.

2. A socket wrench extension for engagement with a socket and a socket wrench comprising:

- a. a main body having
 - a first end defining a cavity having a square cross-section and adapted to receive a portion of the socket wrench,
 - an opposite second end, and
 - an axis that extends through said first and said second ends;
- b. a drive column proximate said main body second end, wherein said drive column is adapted to be received in a square cavity formed in one end of the socket and defining a longitudinal axis that is coincident with said main body axis;
- c. a concave recess formed in said drive column; and
- d. a shoulder formed intermediate said main body second end and said drive column annular recess, said shoulder having a cross section that is larger than a cross section of said drive column recess and smaller than a cross section of said main body, wherein each of said cross sections are taken perpendicular to said main body axis, and

wherein said drive column is receivable in the square cavity formed in the socket in a first position in which said drive column axis intersects an axis of the socket at a non-zero angle, and

a second position in which said drive column axis is coincident with the axis of the socket and said shoulder is matingly received in the square cavity of the socket.

3. The socket wrench extension for engagement with a socket and a socket wrench of claim 2, further comprising:

- a. a blind bore defined in said drive column, said blind bore having an axis that is perpendicular to said drive column axis;
- b. a detent that is received in said blind bore, and
- c. a spring that is received intermediate said blind bore and said detent.

1 4. The socket wrench extension for engagement with a socket and a socket wrench of
2 claim 3, wherein said detent is a ball that is biased radially outward from said blind bore.

1 5. A socket wrench extension and a socket comprising:

2 a. a socket defining a cavity having a square cross-section therein and a second end
3 adapted to engage a fastener; and

4 b. a socket wrench extension having

5 i. a main body that has

6 a first end defining a cavity having a square cross-section and
7 adapted to receive a portion of a socket wrench,

8 an opposite second end, and

9 a longitudinal axis that extends through said first and said second
10 ends;

11 ii. a drive column proximate said main body second end, wherein said drive
12 column is adapted to be received in said socket first end square cavity,
13 said drive column having a longitudinal axis that is coincident with said
14 main body axis;

15 iii. a concave recess formed in said drive column; and

16 iv. a shoulder formed intermediate said main body second end and said drive
17 column annular recess, said shoulder having a cross section that is larger
18 than a cross section of said drive column recess and smaller than a cross
19 section of said main body, wherein each of said cross sections are taken
20 perpendicular to said main body axis, and

21 wherein said drive column is receivable in said socket first end cavity in

22 a first position in which said drive column axis intersects an axis of said
23 socket at a non-zero angle, and

24 a second position in which said drive column axis is coincident with said
25 socket axis and said shoulder is matingly received in said socket first end square
26 cavity so that said socket first end abuts said main body second end.

1 6. A socket wrench extension and a socket comprising:

2 a. a socket having a first end defining a cavity having a square cross-section
3 therein and a second end adapted to engage a fastener; and

- 4 b. a socket wrench extension having
5 i. a main body that has
6 a first end defining a cavity having a square cross-section and
7 adapted to receive a portion of a socket wrench,
8 an opposite second end, and
9 a longitudinal axis that extends through said first and said second
10 ends;
11 ii. a drive column proximate said main body second end, wherein said drive
12 column is adapted to be received in said socket first end square cavity,
13 said drive column having a longitudinal axis that is coincident with said
14 main body axis;
15 iii. a concave recess formed in said drive column; and
16 iv. a shoulder formed intermediate said main body second end and said drive
17 column annular recess, said shoulder having a cross section that is larger
18 than a cross section of said drive column recess and smaller than a cross
19 section of said main body, wherein each of said cross sections are taken
20 perpendicular to said main body axis, and
21 wherein said main body is longer than said drive column, and
22 wherein said drive column is receivable in said socket first end square cavity in
23 a first position in which said drive column axis intersects an axis of said
24 socket at a non-zero angle, and
25 a second position in which said drive column axis is coincident with said
26 socket axis and said shoulder is matingly received in said socket first end square
27 cavity so that said socket first end abuts said main body second end.

1 7. A socket wrench extension for engagement with a socket and a socket wrench
2 comprising:

- 3 a. a main body having
4 a first end defining a cavity having a square cross-section and adapted to
5 receive a portion of the socket wrench,
6 an opposite second end, and
7 an axis that extends through said first and said second ends;

8 b. a drive column proximate said main body second end, wherein said drive
9 column is adapted to be received in a square cavity formed in one end of the
10 socket and defining a longitudinal axis that is coincident with said main body
11 axis; and
12 c. a concave recess formed in said drive column that bisects said drive column into
13 a first part distal from said main body second end and a second part proximate
14 said main body second end; and
15 wherein said drive column is receivable in the square cavity formed in the socket in
16 a first position in which said drive column first part is within said drive socket
17 square cavity and said drive column second part is not so that said axis of said drive column
18 intersects an axis of the socket at a non-zero angle, and
19 a second position in which both said first and said second drive column parts are
20 received in said socket square cavity and said drive column axis is coincident with the
21 axis of the socket.